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SCHOOL

AIR UNIVERSITY

DOCTRINE (MAYBE), STRATEGY (NO):  
WILL THE AIR FORCE IMPLEMENT A FORCE  
PROTECTION PROGRAM?

by

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A Research Report Submitted to the Faculty

In Partial Fulfillment of the Graduation Requirements

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## *Preface*

This paper is dedicated to Captain Kristopher Adams, USAF, one of nineteen airmen who surrendered life as a result of a terrorist bombing at Khobar Towers, Dahrán, Saudia Arabia. The dedication includes his fiancé, Captain Caren V. Ouellette, USAF, whose life changed on that 25<sup>th</sup> day of June, 1996. It is a prayer that this paper brings lessons learned to bear on solutions to the many dilemmas faced by today's military leaders. Otherwise, the sacrifices of Kris and Caren are for naught.

I thank Dr. Barry Schneider for the honesty and professional assistance he provided giving direction to the research that went into the development of this paper. He taught a valuable lesson.

Lastly, I extend gratitude to my wife for her support of my desire to attain a deeper knowledge of the U.S. Air Force. It is her willingness to be separated for my year at the Air War College that allowed me to expand my horizons.

### *Abstract*

The U.S. Air Force response to the Khobar Towers incident is to isolate and consolidate those forces in Saudi Arabia to a remote desert location. Did this response increase the security or did it increase the vulnerability of the forces? With the forces isolated from host country nationals, the terrorist can now select and use chemical and/or biological weapons without fear of reprisal from the host country. At the new location there must be new buildings erected for housing. Will the Air Force permit buildings to be built which collapse when subject to blast loads? Are the civil engineering forces trained to enter a building that is partially collapsed for search and rescue? Is the civil engineering force trained and equipped for the decontamination of the base? Can we afford to train and equip to recover a base from a chemical or biological attack? The Air Force civil engineering community must posture itself to be proactive in force protection, base vulnerability assessment, and mitigation of unacceptable risk. The U.S. Air Force cannot afford to use the civil engineering force only for new or interim “blast protection” construction. The terrorist will defeat physical security measures so it is critical that the base be organized, trained, and equipped to accomplish base recovery. Recommended strategies to develop counters to and mitigate threats are provided.

## Chapter 1

### The Nature of the Threat

*And the four angels (who are bound at the great river Euphrates), who had been prepared for the hour day and month and year, were released, so that they might kill a third of mankind.*

—Rev 9:15

Appearing before a select committee, in a Washington D.C. Senate hearing room on 9 July 1996, was Lt. Gen. Bernard E. “Mick” Trainor, USMC (Ret.). The subject was the bombing of the U.S. Embassy and the Marine barracks at Beirut, Lebanon, thirteen years prior.<sup>1</sup>

...I was the Deputy Chief of Staff for Plans, Policies, and Operations at the time that the American Embassy was bombed, in April 1983, and also when the Marine barracks went up in November of that year.

I had the honored but sad duty, after the Embassy bombing, to accompany the team that went out there to return the bodies.

Subsequent to that we have had two terrorist bombings domestically in the United States, with the World Trade Center and with the Oklahoma City bombing, and then of course, last November we had the bombing in Riyadh, and I have to say to myself, do we never learn. The MO of the terrorists are exactly the same in all instances over these years, and yet we never seem to be able to accommodate them.

In response to Senator Spector, Gen. Trainor said,

The lessons learned are better intelligence, a proactive and an active defense, and *an effective passive defense* (emphasis added).

Gen Trainor also described steps that could be taken by Intelligence to alert field commanders as to the risks.

Well, I am not an intelligence expert, but as an operational commander I would expect the Intelligence Community to give me the general threat analysis that they have and then be as specific as possible as the situation comes along, without raising false alarms, which is frequently the case with the Intelligence Community. In a certain sense, to cover themselves, they are constantly giving you threats.

.....The steps that were taken there (*reference is to the Beirut Marine barracks*) were that the line-troops were dug-in in trenches, a la Korean and World War I. But, the most secure building for the support troops was in the very building that blew up. It had withstood the shelling and the bombing during the battle for the Beirut airport between the Israelis and the Syrians. In a sense, from the conventional threat of artillery fire, mortar fire, and direct small arms fire, that building was probably the safest place for them to be.

The three messages that Gen. Trainor delivered are ones that we never seem to learn. We expect intelligence to define the threat. Passive defense is equally important as active defense. A building may not perform to the functional level that you expect.

## **Lesson Two**

Appearing before the Subcommittee on Treasury, Postal Service and General Government, Committee on Appropriations, on 1 May 1995, was the Hon. Roger Johnson, Administrator, General Services Administration. The subject was the bombing of the Murrah Federal Building in Oklahoma City. Senator Shelby raised an issue about the risk assessment that had been performed prior to the incident. The response of Mr. Johnson was “The assessment was, I think, that one security officer was sufficient.”<sup>2</sup> Mr. Johnson continued,

Yes, sir; I am not sure what to do at the moment about someone driving a truck in front of a facility with a 4-minute fuse in it. Hopefully, we will get at the motives of some of these people and get at the motives of some

of these actions. We are going to do everything possible, including investigating new technologies to be able to detect materials in proximity to the building that might be explosive. On the other hand, then you get to response time. So yes, I think everything is up for complete review and assessment.<sup>3</sup>

The Hon. Johnson delivered three messages. Physical security is not a conclusive answer. The real answer is beyond technology. Maybe someone should look at what is included in a risk assessment procedure.

### **Lesson Three**

Five Americans die when terrorists explode a car bomb outside of the Office of the Program Manager of the Saudi Arabian National Guard (OPM-SANG).<sup>4</sup> It is November 1995. Less than three months later the Air Force Office of Special Investigations (AFOSI) completes a vulnerability assessment of Kohbar Towers at Dhahran, Saudi Arabia. There are 39 recommendations for additional force protection measures. Between November 1995 and June 1996, fourteen suspicious package incidents occur within Khobar Towers.<sup>5</sup> By 24 June 1996 over 130 new security measures are implemented. On 25 June 1996 building 131 at the Khobar Towers collapses when a terrorist truck bomb, parked outside the perimeter fence, explodes.

The message is in two parts. Our vulnerability assessment procedures may have flaws. Significant improvements in physical security did little to preclude the action taken by the terrorist.

### **The Downing Report and the Air Force Response**

Lt. Gen. James F. Record, 12<sup>th</sup> Air Force Commander, was the lead on a team that performed a review of several issues raised by General (Ret.) Wayne A. Downing related

to the Air Force and the incident at Khobar Towers.<sup>6</sup> The Downing Report, *Force Protection Assessment of USCENTCOM AOR and Khobar Towers*, is a list of findings and recommendations prepared for the Secretary of Defense William Perry. Lt. Gen. Record was asked to consider those issues regarding how the Air Force organizes, trains, and equips for the support of forces deployed to Southwest Asia.

Lt. Gen. Record prefaced his report, saying: “the recommendations are relevant, not just to the CENTCOM AOR, but have application to deployments worldwide.”<sup>7</sup> Lt. Gen. Record went on to describe what he perceived to be an institutional shortcoming. Lt. Gen. Record recommended a new organization at the Air Staff. The organization would:

- write USAF doctrine and policy guidance on Force Protection;
- be the resource advocate for Force Protection programs;
- monitor and select Force Protection Research and Development programs.<sup>8</sup>

The organization that is the result of that recommendation is the Air Force Security Forces (AF/SF). It became a reality on 1 January 1997. A subordinate unit, the 820<sup>th</sup> Security Forces, stood up on 1 July 1997. These organizations implement the Air Force Antiterrorism (AT) program.<sup>9</sup> Regardless of the intent of the new organization, or the desire of leadership for Air Staff Directorate integration and support, the focus of the Security Forces invokes a literal interpretation of the concepts force protection and Anti-terrorism but leave important tasks out.<sup>10</sup> Force protection is being implemented as physical security. Anti-terrorism is implemented as the defense of individuals by local military forces. Unfortunately, there is no attention given to the recovery of a base subject to an attack employing Weapons of Mass Destruction (WMD).

The emphasis of the Anti-Terrorism program, to date, is on the development of a heavily armed force that will offset the perception that the Army will not be providing security at the tactical perimeter of the airbase.<sup>11</sup> The Army has responsibility for the “outside of the fence” security for airbases. The Air Force perceives that the Army is not there because Army units are dedicated to battle ground areas which are usually forward of the airbase location. The emphasis of the force protection program is, therefore being dedicated to “set(ing) the stage and laid the foundation for invigorating the warrior spirit in every airman.”<sup>12</sup> And, in the rush of developing the perimeter defense, a strategy and a doctrine for an Anti-Terrorism program, in any substantive form, has been omitted. This is especially true in the publications that describe the role of the Civil Engineer and, in particular, those publications that describe base recovery from attack.

This paper provides an analysis of the roles and responsibilities of civil engineering. It demonstrates that individual organizations, rather than a corporate Air Force, are attempting to accomplish the Force Protection Initiative. Under current procedures, the civil engineers do their thing; the medics do theirs; and the Security Forces do theirs. The Anti-Terrorism, or Force Protection Initiative, to date, is simply a collection of parochial activities, by individual Air Force organizations, without an integration of the resources necessary to counter a common threat. An alliance is required.

## **A Historical Perspective**

A conventional explosion caused a partial collapse of the U.S. Embassy building in Beirut, Lebanon, in 1983. But, no one suspected that, eight months later, someone driving a truck, laden with explosives, would cause collapse of the Marine Barracks at the

Beirut airport. The total collapse of the barracks resulted in the death of 253 U.S. Marines.<sup>13</sup> The incident demonstrated an asymmetric threat not previously considered by U.S. Commanders. The response by the Air Force, and other defense organizations, was to withdraw U.S. forces, and to improve physical security measures. Improvements included the construction of barriers at entry points to government installations, and New Jersey type barricades in front of the White House.

A truck bomb explosion under the World Trade Center, in New York City in 1993, in the parking garage, continued the series of terror episodes. The building did not collapse, but the deaths of 6 people left a lasting impression on private sector intelligence and security forces.<sup>14</sup> An internal terrorist threat, and vulnerability not previously considered, was further revealed to the American public with the bombing at the Murrah Federal Building in Oklahoma City in 1995. Following that, the U.S. Air Force was the next target. The death of 19 Airmen at the Khobar Towers, Saudi Arabia, turned the attention of the Department of Defense, the U.S. Congress, and the rogues of the world to the vulnerability of U.S. military forces. The Department of Defense, in response to the new threat, created the Force Protection Program. But, some questions remain. “What will be the nature of the next incident?” Has anyone asked, “How will we respond the next time?” Most Air Force leaders will respond that there is a plan for disaster response and recovery. It is a civil engineering function.

### **Nuclear, Chemical, or Biological? Or Conventional?**

According to terrorist plans, the World Trade Center was meant to collapse “amid a cloud of cyanide gas.” Instead, the tower did not fall, and the “cyanide gas burnt up in the heat of the explosion.”<sup>15</sup> This was a narrow escape for New York City. Two years

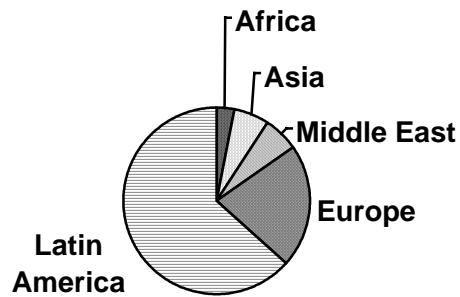
later, Tokyo, Japan was not so fortunate. The Aum Shinrikyo put fear into the Japanese population and the world.

The revelation that a religious sect, Aum Shinrikyo, was responsible for the release of Sarin gas in a Tokyo subway, on 20 March 1995, raised the curtain on the terrorist use of weapons of mass destruction. That act brought into reality the previously unspoken fear of chemical, and biological attacks, by terrorist groups. The threat of chemical and biological weapons also grabbed the worlds attention in 1991, when Saddam Hussein “ (Iraq) entered the Gulf war with a known chemical warfare capability and a demonstrated willingness to use it. Iraq used chemical weapons against Iranian troops and it’s Kurdish population during the 1980’s.”<sup>16</sup> The “Poor Man’s Nuke,” represented by chemical and biological weapons, is now a threat to all populations.

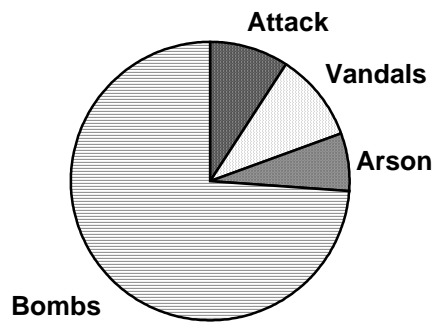
There appears to be a general consensus among experts that chemical weapons are easier to manufacture, have a higher probability of being successful, and as proven by Aum Shinrikyo, are easier to employ than either nuclear or biological weapons. One authority says, “If mass destruction terrorism were to occur, it would more likely be chemical or biological than nuclear, with chemical terrorism perhaps the most likely prospect of all.”<sup>17</sup> Nuclear weapons usually present more technical problems than most groups are capable of solving. Biological weapons are sensitive to the environments in which they are manufactured, and to which they are introduced. The weapon of choice, therefore, appears to be conventional explosives, chemical agents, or combinations of each.

### **Who is the target?**

The anti-US attacks, by region, reported by the State Department for the year 1995 are summarized in Figure 1. The anti-US attacks, by type of event, for 1995 is summarized in Figure 2.<sup>18</sup> There were a total of 99 anti-US attacks out of 440 international attacks total for the year 1995. The use of bombs is prevalent and most incidents occurred within the western hemisphere.



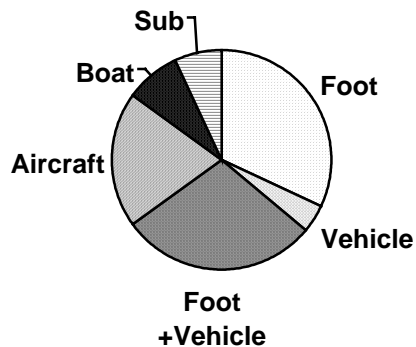
**Figure 1 – Anti-US Attacks by Area, 1995**



**Figure 2 – Anti-US Attacks by Event, 1995**

### **What is the Method of Delivery?**

The Rand Corporation, under contract to the U.S. Air Force, looked at the known attacks on airbase locations, worldwide, for the period 1940 through 1992. Figure 3 is a summary of that study. The data does not include the Vietnam War where there were 493 attacks that were executed by people on foot or by standoff. The data does include three ground attacks that resulted in damage to 36 aircraft during the 1991 Gulf War.<sup>19</sup>



**Figure 3 - Attack Tactics, 1940 - 1992**

The United States has a global threat. The continental United States is not excluded. The attack can be against a deployed unit by terrorists or by another armed force. The attack can be against a domestic base by foreign or internal insurgents. The weapons can include hand- carried bombs, a vehicle laden with explosives, a chemical, or a combination of explosives and chemicals.

### **Are CB Weapons Available?**

There are a number of states that traffic in CB weapons or materials for such weapons. For example, “North Korea sells equipment and technologies to generate hard currency revenues for it’s depressed economy and as a means of supporting continued research and development for it’s NBC (Nuclear, Biological, and Chemical) weapon and missile programs.”<sup>20</sup> North Korea owns the production capability, and has the delivery mechanisms, to employ chemical weapons. They also have the sale and shipment infrastructure to easily provide complete systems, technology, or knowledge to the

international community. Customers of North Korea are more than willing to participate in the proliferation of chemical and biological weapons.

Iran, Iraq, and Libya have each demonstrated the willingness and the technical capability to employ chemical weapons. Each envisions the United States, and other western countries, as a primary enemy. Iraq has, in inventory, several weapons capable of delivering chemical weapons. The chemical weapons delivery systems include mortars, rockets, spray tanks, aerial bombs, and SCUD type missiles.<sup>21</sup> The threat appears to be credible.

### **The Department of Defense ( DoD) Program**

Secretary of Defense Perry, in response to the Downing report,<sup>22</sup> stated that DoD Directive 2000.12, *DoD Combating Terrorism Program*, was being issued as a directive. The previous issue of 2000.12, August 1990, was advisory in nature. The Joint Chiefs of Staff (JCS) issued publication 3.07-2, *Joint Tactics, Techniques, and Procedures for Antiterrorism*, in response to the DoD directive. The JCS publication defines general command and control relationships, and offers organizational examples for potential anti-terrorism operations. A vulnerability assessment checklist is included as Appendix A of the JCS publication for use by bases located in the United States.

#### **What are Vulnerabilities?**

The JCS publication 3.07, *Joint Tactics, Techniques, and Procedures for Anti-Terrorism*, refers to vulnerability in terms of physical security. The procedure for determining one's degree of vulnerability involves assigning a numerical value to several

categories of assessment. The more points assigned the higher the vulnerability. The assessment characteristics include the:

- base sensitivity (mission and population),
- geographic region,
- status of the response force training,
- distance from other military units or bases,
- communications security,
- extent of isolation,
- availability of non-military law enforcement,
- terrain,
- access,
- unity of security effort,
- proximity to foreign borders.

In ascertaining the status of response force training (item 3 above), a subjective evaluation is made of the qualifications of the on-base anti-terrorism specialists.

### **Risk Assessment and Vulnerability Analysis**

What are the chances that a particular airbase is the target of either a terrorist group, a rogue nation, or another armed regional force? Deriving the answer is a highly subjective process and partially dependent upon where the base is located. In some situations the probability of an incident will be readily apparent. The probabilities are high that a base, in a forward operating area, where hostilities exist, will be a target. But, what is the probability that a base located in the plains of the central United States will be a target? And, what about the environments which exist between these extremes?

Former Senator Sam Nunn summarized the dilemma.

If you looked at any one American City and said “What are the odds of this happening in city X?”, you could perhaps say the odds are pretty strong against it. If you look at all American cities and say “what are the odds of chemical or biological attack in one or more of these cities in the

next two to five years?”, I think the odds are pretty strong that it will happen.<sup>23</sup>

### **What are the Risks?**

Risk involves determining the probability (the odds) that an adversary will select a certain target. A high risk does not mean that the target will be selected, but it provides an indicator that preparations to recover from an event should be serious. There are risk equations that attempt to put logic and priority, in a quantitative sense, into a determination of the risk.

One risk equation is:

$$\text{RISK} = \text{THREAT} \times \text{VULNERABILITY} \times \text{CRITICALITY}^{24}$$

The variables are:

- Threat – The ability and intent of an adversary to inflict injury or damage. For a threat to exist there must be a demonstrated capability and intent to carry out an attack.
- Vulnerability – The susceptibility of a facility or facility asset, system, or infrastructure to a damaging action.
- Criticality – The impact of the loss.

The equation provides a risk assessment that is largely subjective. One of the direct variables of the equation involves the ability of the unit to apply force and the adequacy of the physical security measures. The model is therefore directly dependent upon counter-force and physical security to influence a risk a low risk decision.

An alternative risk assessment is The C.A.R.V.E.R. Method.<sup>25</sup> The acronym stands for Criticality, Accessibility, Recoverability, Vulnerability, Effect on Population, and Recognizability. The method involves assigning numerical values to each of the elements of the equation for each facility within a complex. The result is a matrix, or a map of the most vulnerable buildings, of all the facilities within the complex. Again, the

assignment of value and the resulting risk is largely subjective. The C.A.R.V.E.R. Method is independent of the physical security aspects. But, there is a requirement to evaluate ease of access to a certain site within a complex.

### **The Air Force Base Vulnerability**

Each of the models for assessing risk and/or vulnerability assumes that there are physical barriers for the terrorist to overcome in order to accomplish the objective. None of the methods assesses or grades the ability of a base to respond to an event. The fragility of the target itself is ignored.

Unfortunately, each Air Force base has a hidden vulnerability, vulnerability that is the result of conditions other than physical security measures or base location. The vulnerability will be explored in chapters that follow.

### **Notes**

<sup>1</sup> Senate, *Saudi Arabia and Beirut, Lessons Learned on Intelligence Support and Counterterrorism Programs: Hearings before the Select Committee on Intelligence*, 104<sup>th</sup> Cong., 2<sup>nd</sup> sess., 9 July 1996, 4-6.

<sup>2</sup> Senate, *Oklahoma City Bombing: Hearing before a Subcommittee of the Committee on Appropriations*, 104<sup>th</sup> Cong., 1<sup>st</sup> sess., 1995, 8.

<sup>3</sup> *Ibid.*, 21.

<sup>4</sup> Lt Gen James F. Record, 12<sup>th</sup> AF/CC, memorandum to Air Force Chief of Staff and Secretary of the Air Force, In Turn, subject: Independent Review of the Khobar Towers Bombing, Part A, 31 October 1996:, 2, on-line, Internet, October 1997, available from <http://www.af.mil/current/Khobar>.

<sup>5</sup> *Ibid.*, Part IIIc, 2.

<sup>6</sup> *Ibid.*, 2.

<sup>7</sup> *Ibid.* CENTCOM AOR is a military acronym for Central Command Area of Responsibility. CENTCOM is a joint service specified command with regional responsibility for the employment of U.S. military forces in the Middle East.

<sup>8</sup> Lt Gen James F. Record, memorandum of 31 October 1996. The specific recommendations also included responsibility for the recommended organization to

## Notes

interface on joint services and allied forces issues and to keep the USAF Corporate Structure informed on status/issues on Force Protection.

<sup>9</sup> Air Force Instruction (AFI) 31-210, *The Air Force Antiterrorism (AT) Program*, 1 July 1997. The functions and duties of the AF/SF and assigned supporting functions for other Air Staff Directorates are provided in detail.

<sup>10</sup> Air Force Doctrine Document (AFDD) 2-3, *Military Operations Other Than War*, 5 October 1996. The definition of Force Protection is: (A) Security program designed to protect soldiers, civilian employees, family members, facilities, and equipment, in all locations and situations, accomplished through planned and integrated application of combating terrorism, physical security, operations security, personal protective services, and supported by intelligence, counterintelligence, and other security programs. AFI 31-210 defines antiterrorism as defensive measures used to reduce the vulnerability of individuals and property to terrorist attacks, including limited response and containment by local military forces.

<sup>11</sup> Lt Gen James F. Record, memorandum of 31 October 1996. Lt Gen Record describes the requirement for the US Army to protect U.S. airbases in Forward Operating Areas. However, since the airbase is usually located in a rear area, and away from the battle lines, the Army elects to perform their protection role only on an as needed basis.

<sup>12</sup> Air Force Security Forces Fact Sheet, *Force Protection*, 17 December 1997, 2.

<sup>13</sup> Eric M. Hammel, *The Root: Marines in Beirut, August 1982-February 1984* (San Diego, CA: Harcourt, Brace, and Jovanovich, 1985), 429.

<sup>14</sup> Laurie Mylorie, "The World Trade Center Bomb: Who is Ramzi Yousef? And Why It Matters," *The National Interest* – Winter 1995/6, Number 42, Page 3, 1996.

<sup>15</sup> *Ibid.*

<sup>16</sup> Department of Defense, *Proliferation: Threat and Response 1997* (Washington, D.C.: Office of the Assistant Secretary of Defense, November 1997), 23; on-line, Internet, 25 November 1997, available from <http://defenselink.mil/pubs/>.

<sup>17</sup> Joseph F. Pilat, "NBC Terrorism After Tokyo," in *Terrorism With Chemical and Biological Weapons: Calibrating Risks and Responses*, ed. Brad Roberts, (Alexandria, VA: The Chemical and Biological Arms Control Institute, 1997), 19.

<sup>18</sup> Department of State, *Patterns of Global Terrorism, 1995*, (Washington D.C.: Office of the Coordinator for Counterterrorism, April 1996), 69-73.

<sup>19</sup> David A. Shlapak, *Check Six Begins on the Ground: Responding to the evolving ground threat to U.S. Air Force bases*, (Rand Corporation, Santa Monica, CA., 1995), 32.

<sup>20</sup> *Proliferation: Threat and Response 1997*, November 1997, 4.

<sup>21</sup> *Ibid.* 31.

<sup>22</sup> William James Perry, *Force Protection: Global Interests, Global Responsibilities: Secretary of Defense report to the President*, (Washington, D.C.: Department of Defense, 16 September 1996).

<sup>23</sup> CBDCOM Fact Sheet available on <http://www.nbc-prepare.org>.

<sup>24</sup> A risk assessment model developed by The Proteus Security Group, Inc., on-line, Internet, 8 December 1997, available from <http://www.anti-terrorism.com/risk.html>.

<sup>25</sup> *Ibid.*

## Chapter 2

### Organizing for Vulnerability

*Boss: "We'll need a name for the newly reorganized department. The name should reflect how I've integrated engineering with food services and procurement."*

*Dilbert and Staff: "How about chips and dips?" "Blind ambition?" "The un-led?"*

-From DILBERT by  
Scott Adams

The bombing of Khobar Towers is the subject of the Downing Report which has a focus three issues: standards for physical security, the organization for Command; and, the need for integrated intelligence at Middle East installations. The report articulates a need to avoid inconsistent force protection practices. It cautions that adoption and implementation of the recommendations of the report, or findings will not assure an environment secure from all potential threats.

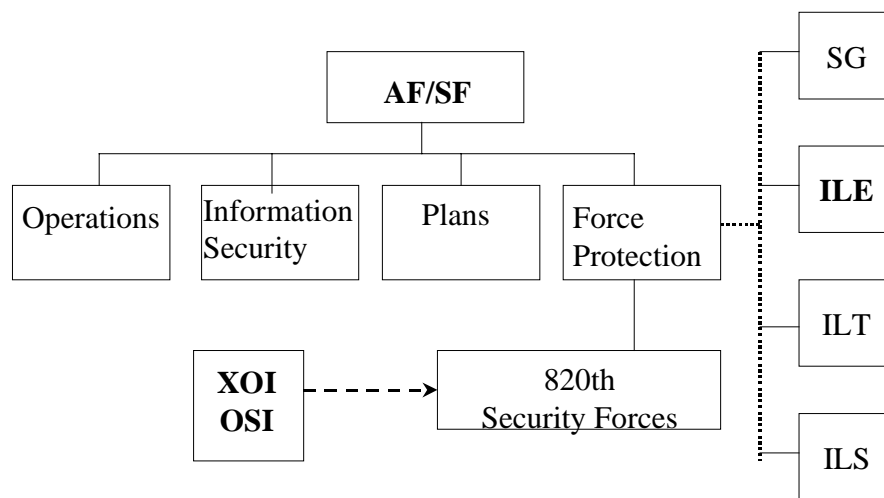
### The Need for A Response Force

Lt. Gen. Record, in his independent review of the Downing Report, echoes concern that there will never be an absolute in force protection. In addition, the report of Lt. Gen. Record stresses the need for a new mind set about force protection, and the need for a dedicated force protection organization within the Air Staff. Lt. Gen. Record also

envisioned a response force to counter the threat. That response force would be an organization that would be the sole Air Force authority for force protection.

### **Force Protection (or Anti-terrorism)**

The new directorate at the Air Staff, as of 1 January 1997, is the Air Force Security Force (AF/SF). The organization is described in Figure 4.



**Figure 4. Security Forces Organizational Diagram**

The implementing guidance for the Security Force is found in Air Force Instruction (AFI) 31-210, *The Air Force Antiterrorism (AT) Program*, dated 1 July 1997. Responsibilities for direct support of the Force Protection element are summarized in Table 1. The Surgeon General (SG) and the Logistics Directorate (IL) provide support on an as requested basis.

**Table 1. Summary of Directorate Responsibilities**

<b>Directorate</b>	<b>Responsibility</b>
AF/SF – Director of Security Forces	Sets policy for the AT program, develops guidance on physical security
OSI – HQ Air Force Office of Special Investigations	Anti-terrorism training for AT Training Course, Maintains counter-intelligence data on terrorist activities, threat assessment updates, focal point for armored vehicles
XO - Director of Intelligence, Surveillance, and Reconnaissance	Monitors worldwide terrorism, foreign intelligence, security, counter-terrorism
SG – Surgeon General	Sets Medical support requirements for antiterrorism planning
ILE – Air Force Civil Engineer	Project approval and funding to construct and modify facilities
ILT – Air Force Director of Transportation	Coordinates policies affecting travel security policy, distributes advisories
ILS – Air Force Director of Supply	Programming for non-tactical armored vehicles
820 <sup>th</sup> Security Forces	Deploy to a forward location and conduct an assessment of Force Protection requirements. The Area of Responsibility is between the fence and a undefined tactical perimeter

The 820<sup>th</sup> Security Forces is a 64-member team of several individual specialties including:

- Security Forces (34)
- OSI (4)
- Intelligence (3)
- Communications (6)
- Administration, Medics, Maintenance (14)
- Civil Engineers (6)

The Civil Engineering (CE) team includes a leader, a site developer, two explosive ordnance disposal (EOD) people, and two experts in Readiness. The civil engineering people, as a part of the 820<sup>th</sup> Security Force, have three specific functions.

- “bed-down” the security forces group
- evaluate explosive ordnance and chemical/biological threats and counters
- specify skill requirements for follow on reinforcements.

### **The Civil Engineer Role**

The traditional role of civil engineering, in a wartime environment, and/or a forward deployment, is to “bed-down” a unit at a base. Performed by the *Prime BEEF* (Base Engineer Emergency Force), the tasks include:

- area explosive ordnance disposal,
- developing water supplies and sanitary facilities,
- providing electrical power,
- hardback tent erection,
- airfield repair,
- airfield lighting installation, and
- fire protection.

Civil engineering people also provide Force Protection construction in the form of barriers, fencing, hardened shelters, etc., when the situation requires.<sup>1</sup> *Prime BEEF* training to perform the direct support tasks is accomplished with the participants garbed in their individual chemical protection gear.

Within the civil engineering organization is the Readiness function. The primary responsibility of Readiness is to perform the *Prime Beef* mission and the Disaster

Preparedness function. Disaster Preparedness moved to the civil engineering organization from the support group after the Air Force re-organization of 1992. Historically, the focus of disaster preparedness has been on natural disaster recovery, nuclear decontamination and shelter operation, and personnel protection in a chemical/biological environment. Locating and marking the location of contamination in a chemical and/or biological environment is a responsibility of those people assigned the Disaster Preparedness function.

Follow-on support, in the form of reinforcements, for the 820<sup>th</sup> Security Force civil engineer, must come from civil engineering readiness groups at domestic bases. Therefore, the reinforcements must be trained, organized, and equipped prior to a force deployment. The training and organizing must evolve from the day-to-day functions of the readiness group.

### **Air Base Operability (Readiness) – The Traditional Role**

Air Force Instruction (AFI) 10-212, *Air Base Operability*, assigns the responsibilities for passive defense of the base, either abroad or in the U.S., to civil engineering. Active base defense responsibilities are assigned to the Security Police (AF/SPO). Installation Commanders are responsible to see that the base operability response force is trained and that the proper equipment is available. The Disaster Preparedness group is responsible for preparing a plan for employment of the Air Base Operability response force.

Disaster Preparedness planning is accomplished by the civil engineer as it “relates to major accidents, natural and man-made disasters, and enemy action.”<sup>2</sup> The plan describes functional responsibilities, planning objectives, Nuclear, Biological,

Chemical, and Conventional (NBCC) emergency response, exercise requirements, training, warning and notification systems, and enemy attack actions. Individual units at the base level, other than civil engineering, must ask for assistance from the Disaster Preparedness (Readiness) office as they “plan, manage, and operate their protective shelter program.” Individual units also have responsibility to establish their individual Nuclear, Biological, and Chemical (NBC) contamination control capability. Air Force Instruction 32-4001, *Disaster Preparedness Planning and Operations*, specifies that a minimum contamination control capability will be in aircraft maintenance, transportation, civil engineering, and the medical activities. However, contamination control activities are limited to individual protective gear equipment and storage.

The document that implements the Disaster Preparedness operations is Air Force Manual 32-4005, *Personnel Protection and Attack Actions*. The focus of the document is shelter planning. The Installation Commander is charged with the responsibility to provide shelter spaces for people assigned to the base. In addition, the need and use of open air Contamination Control Areas (CCAs), for nuclear zones, and toxic free areas (TFA), for chemical-biological environments, are articulated.

If a base is subject to attack with chemical or biological agents, civil engineering is tasked to deploy and integrate automatic detection, identification, and warning systems. After an attack occurs, civil engineering has the responsibility to locate and mark chemical or biological contaminated areas. The reason for marking contaminated areas is an attempt to restore base operations by contamination area avoidance. The premise being that if the area is marked, people will stay out of the area in an attempt to perform

their mission function. Contamination avoidance is a primary doctrine articulated in Disaster Preparedness publications.

Contamination control includes avoidance, marking, detecting, and decontamination. Under current doctrine, decontamination does not include areas, but is accomplished only to minimize contact hazards and to limit spreading of contamination by individuals or equipment. Individual units, such as transportation, aircraft maintenance, medics, etc., have responsibility for the equipment that is to be used for contamination control. Disaster Preparedness provides assistance through oversight and consultation.

### **What's Wrong with this Picture?**

The following are examples of conflict that exist between current publications and what could be envisioned as an attack scenario.

- The Air Force can expect an attack against a base. The attack will be without warning, and a complete surprise. It is highly unlikely that a nuclear weapon will be employed. If a nuclear weapon were employed, it is highly unlikely that the target base would be involved in damage assessment, contamination control, or decontamination. The unit that would accomplish the recovery function would be from another area.
- Attack with a conventional explosive is the highest probability. An attack could include the use of chemicals. Biological weapons could be employed but it is not likely. If this is the threat then what will be the response of the Air Force base? Will the base be evacuated? Is partial base decontamination a consideration? These questions are not answered by current publications.
- The Anti-terrorism program is organized for response to an aggressor by a heavily armed force, within a tactical perimeter, which surrounds a fence that is hardened against penetration. The underlying assumption is that the intelligence has been improved to the level that it is predictive.<sup>3</sup>
- Hidden in the 820<sup>th</sup> Security Force responsibility is recognition of a need to counter a chemical or biological environment. It is implied that this threat will only exist at a location outside of the United States because the 820<sup>th</sup> Security Force is designated as an expeditionary force. It is also assumed that there will be a warning of an attack. Civil engineering is responsible for training those people that will work in a chemical or biological environment. The base training

expertise resides in a Readiness Officer who, in the peacetime environment, prepares plans and provides advice to other units about operating individual unit shelters and individual contamination control programs.

- The civil engineering training doctrine, for the response to the chemical or biological environment, is that “Protected people can work with contaminated equipment. Therefore, decontamination must be aimed at restoring mission capability rather than totally eliminating the hazards.”<sup>4</sup> Additionally, since it is assumed that there is warning of the attack, detectors were set out and the contamination areas are known. In theory it is a duck and cover exercise.
- The Installation Commander is responsible for staffing, training, and equipping individual units to respond to an emergency, man-made or natural disaster, or an enemy attack. But, only those units or people that are being deployed to locations abroad, or those bases which store or transport chemical weapons, are required to train and exercise.
- The Installation Commander is responsible for setting the priorities for contamination avoidance and decontamination. But, each unit is responsible for decontamination of those areas or pieces of equipment within their functional responsibility. Civil engineering is tasked to do limited area decontamination but Transportation is tasked to decontaminate the equipment that will be used by civil engineering. But, civil engineering “must have operating procedures available for decontaminating civil engineering critical vehicles.”<sup>5</sup>

Some questions remain: Who responds to the dormitory building where an unannounced explosion causes partial building collapse? How do they respond? Is the building safe to enter? Are chemical or biological agents present? How can the area be decontaminated and marked for work around? Where are the security forces?

## **Observations and Considerations**

Two significant changes influence the out-of-focus Disaster Preparedness picture. The first is the Air Force reorganization that occurred in 1992 that put Disaster Preparedness into the bowels of the Civil Engineering organization, and out of a position of influence with the Support Group Commander. The second is the new Air Force publications system, adopted during the period of the reorganization. Some of the confusion that is apparent in the current publications may be because of the necessity to rapidly organize and combine old publications. But, Force Protection is a new function

created after the administrative shake-up. The current leaders are the only ones that can explain the absence of a clear doctrine or the clear articulation of expectations.

The present Force Protection effort is a literal interpretation of the recommendations contained in the Downing Report and the independent review of Lt. Gen. Record that suggested such changes as increasing physical security, improving intelligence, etc. Unfortunately, the implementation is doing just what each report warned against doing. It is being assumed erroneously that absolute physical protection can be accomplished. The needs of a base response force are being ignored. The Air Force is still not performing the mission to train, organize, and equip for a synergistic Force Protection effort. The way we are organized at the base level is not consistent with the way we expect to fight. Our vulnerability is the present inappropriate and lack of articulation of the expectations.

### Notes

<sup>1</sup> Air Force Handbook (AFH) 10-222, Volume 3. *Guide to Civil Engineer Force Protection*, 1 June 1997.

<sup>2</sup> Air Force Instruction (AFI) 32-4001, 1 August 1997, statement of intent.

<sup>3</sup> Department of Defense, *Proliferation: Threat and Response 1997* (Washington, D.C.: Office of the Assistant Secretary of Defense, November 1997, 14; on-line, Internet, 25 November 1997, available from <http://defenselink.mil/pubs/>. The NATO Senior Defense Group on Proliferation has adopted a set of core, integrative capabilities for continuing enhancements and improvements. Those capabilities include: Strategic and operational intelligence; Automated command, control, and communications; Continuous, wide area ground surveillance; Standoff detection and warning; Extended air defenses; and NBC individual protective equipment for ground forces.

<sup>4</sup> Air Force Civil Engineer Support Agency, Readiness Directorate, *Readiness and Disaster Preparedness Training Package F15*, 1 February 1997, on-line, Internet, 1 December 1997, available on <http://www.afcesa.af.mil/AFCESA/Readiness/Readiness/training.html>.

<sup>5</sup> Air Force Instruction (AFI) 10-211, 30 March 1994, paragraph 3.3.7.

## Chapter 3

### Mitigating the Vulnerabilities

*If you come to a fork in the road, take it.*

—Yogi Berra

Mitigation is a concept often interpreted as being judgement. But, it is not judgement. It involves the recognition and adaptation of any sustained action taken to reduce and eliminate long-term risk to human life and property.<sup>1</sup> But, before there is mitigation, there must be the recognition that a conflict exists. Then, there must be a plan to mitigate the conflict and resources must be identified that will be used to implement the adopted plan. This implies that a strategy has been clearly articulated or, from the situation, it will be apparent

### Strategy and Doctrine

The Department of Defense has a process that is intended to incorporate top-down, strategy-driven defense objectives. Defense Secretary William Perry, in his remarks to the Senate Armed Forces Committee, summarized the process as follows.<sup>2</sup> The Secretary is responsible for a clear policy direction, the role of civilian leadership, so that experts in the military may make plans and take clear concrete steps to carry out those policies. Those operations and plans devolve downward until they reach the

platoon and squadron level. Secretary Perry includes force protection as a priority in every military plan.

“Strategy is a broad concept, embracing an objective, resources, and a plan for using those resources to achieve the objective.”<sup>3</sup> “A course of action is not a strategy. A course of action is simply one of many statements about how an objective might be achieved.”<sup>4</sup>

The apparent strategy of the Air Force appears to be that enunciated by Defense Secretary Perry. He said, “Our Goal must be to try to find and strengthen those weak spots with what I call “passive defenses” - - - guards, barriers, fences, etc.”<sup>5</sup> The current force protection program is a very literal interpretation of that statement. The statement clearly describes the path being adopted. The statement is only a course of action, but it also, in fact, articulates doctrine.

“Military doctrine is what we believe about the best way to conduct military affairs.”<sup>6</sup> Doctrine has many functions. Its first function is to provide a tempered analysis of experience and a determination of beliefs. Its second function is to teach those beliefs to each succeeding generation. Its third function is to provide a common basis of knowledge and understanding that can provide guidance for actions.<sup>7</sup> Numerous doctrine statements exist within the documents that implement the force protection program. U.S. Air Force strategy statements do not yet exist.

Therefore, the first step for mitigation of the force protection program is to adopt a strategy. A recommended strategy could be the concept proposed by General Trainor to provide “ a low risk threat environment through better intelligence, a proactive and an active defense, and an effective passive defense.”<sup>8</sup>

Assuming that this is a viable strategy, an organization is required that will implement the strategy. Doctrine needs to be adopted that is consistent with the strategy, relevant training needs to be accomplished, and the measurement of performance of the organization against pre-determined standards must be established.

## Organization

A possible doctrine statement that could be adopted is that the U.S. Air Force base be prepared, at all levels, to respond to terrorist activity anywhere in the world, including Hometown Air Base USA. The options that are available to implement that doctrine include those outlined below.

- **Option 1. Allow the situation to continue in the status quo.** This requires that we adopt a strategy of not recognizing that a threat exists at our domestic installations. Since that is not a recommended doctrine, this is not a viable option.
- **Option 2. Leave the Disaster Preparedness function in the Readiness group of the Civil Engineer organization.** This option will require that all of the publications that deal with the requirements be vertically and horizontally integrated with other organizations. The Civil Engineer must learn how to articulate the Readiness function in terms of the threat and the anticipated response. The base recovery plan must be developed to reflect the intended method of doing the tasks of base recovery in the wartime environment. There is the need to develop all the base resources to achieve a synergy during the response, rather than having several individual units competing for recovery resources. The Civil Engineer must develop a mechanism to identify Force Protection resource requirements to the base Security Force manager (the Anti-Terrorism Officer).
- **Option 3. Put the Disaster Preparedness function with the Anti-Terrorism (AT) Officer at the air base level.** The Explosive Ordinance Disposal (EOD) function would remain with civil engineering. This option only moves the responsibility for doing the training and equipping to another organization. But, it would create a familiar line of authority between the AT Officer, the Support Group Commander, and MAJCOM, and Air Staff, Security Force (SF) functions. Civil engineering would continue to provide the envisioned role of facilities construction, modification, repair, and force bed-down.
- **Option 4. Put the Disaster Preparedness function in an advisory capacity to the Installation Commander under the purview of the Deputy Installation Commander.** In addition to bringing the planning function for base recovery

under the person responsible for directing the base recovery, the Disaster Preparedness function is assigned a leadership function by nature of position in the hierarchy of command. Articulation for resource requirements will come from the office of the person in need of the resources.

If adequate Force Protection is to be accomplished at airbases, then doctrine needs to be developed from the command perspective. If we are not going to involve the force in base recovery, and only evacuate when attacked with chemical or biological agents, then we need to enunciate that perspective. If we are going to do area decontamination to allow for base evacuation or recovery, then that position also requires articulation. The Installation Commander must be the one to articulate the mission. These issues are most clearly articulated at the command level and not through obscure training criteria. Option four is the correct course of action if the perceived threat is realistic.

### **Why do Buildings Fall Down<sup>9</sup>**

The Downing Report says U.S. Forces and facilities in Saudi Arabia, and the region, are vulnerable to terrorist attack. Lt. Gen. Record responds in part, “U.S. Air Force personnel and facilities will always be vulnerable to a widening range of terrorist attacks. No amount of Force Protection measures will prevent a determined terrorist from executing an attack...”<sup>10</sup> The resolution recommended by Lt. Gen. Record, is to “physically harden structures based upon the threat, and to develop guidance on required stand-off distances and the construction of blast walls and the hardening of buildings.”<sup>11</sup> The response makes sense for any particular building, but it is not practical force-wide because of expenses. Stand-off distance, blast walls, and building hardening are expensive, and the proper solution varies directly with the explosive quantity. It is out of

the question to expect that all buildings, considered a risk, would be hardened. A more reasonable, and economical, solution must be adopted.

Except for the World Trade Center, a partial collapse occurred in each of the buildings that have been attacked since 1983. The reports of investigation for the Murrah Federal Building and the Khobar Towers attribute most of the deaths that occurred to the progressive collapse of the buildings.<sup>12</sup> In the case of Kohbar Towers, the effects of the bomb blast were only found on the first and second floor of the building.<sup>13</sup> “The upper floors had little concrete debris, suggesting that the lower floor facades were blown into the building, while the upper facades fell straight down into a rubble pile when the underlying support was removed. In addition, the outer east and west walls of Building 131 [at Khobar Towers] were displaced four feet outward, causing the floor slab in the front half of the end bedrooms to collapse.”<sup>14</sup>

Unlike Khobar Towers, the World Trade Center building did not collapse because the construction incorporated redundancy to account for lateral loads.

### **The Different Building Types**

The Federal Emergency Management Agency (FEMA) has published a procedure for determining which buildings, within an inventory of existing buildings, are considered as being a risk during seismic events. The procedure begins by placing a building into one of 15 different building types.<sup>15</sup> Engineers then use the classifications to accomplish a life safety risk analysis. In compliance with Executive Order 12941, *Seismic Safety of Existing and Leased Federal Buildings*, the Air Force built an inventory which includes every existing building on every Air Force installation within the United States and its territories. The results of a risk analysis of the inventory confirms that

non-ductile concrete frame buildings, pre-cast concrete buildings, and most masonry buildings are subject to collapse under lateral loads of seismic forces. These same buildings are, therefore subject to collapse from blast forces.

One solution to this problem is obvious. Build new buildings. New buildings can be designed to incorporate the ductility necessary to resist these loads. However, replacing all presently deficient buildings would be so expensive as to be totally impractical.

### **New Building Design Criteria**

Since the bombing of the Murrah Federal Building, the General Services Administration has decided that new buildings should include provisions to preclude progressive collapse. Even with such measures, the loss of life cannot be totally prevented, nor can such designs prevent buildings from being severely damaged, but the unnecessary loss of life caused by collapse can be minimized. The cost for redundant design is about 1 to 2 per-cent of the building cost.<sup>16</sup> Thus, significant improvement in building performance can be attained without hardening. Actual hardening of a building multiplies the basic cost. The Air Force has not, but should, adopt a policy for protectively designing new buildings that will shelter high occupancy.

The Air Force, "*Installation Force Protection Guide*," published in 1997, makes a recommendation that "new buildings should be designed against progressive collapse."<sup>17</sup> The basis for this recommendation is based upon a protective collapse design policy that has been adopted by the General Services Agency. But, what does the Air Force do about existing buildings considered to be a risk? There isn't enough money in any agency budget for the reconstruction of at-risk existing buildings.

## **Existing Buildings are the Problem**

The Air Force owns about 98,000 buildings. Only about 18,000 of these are constructed with consideration for seismic loads.<sup>18</sup> Moreover, a study of those buildings has proved that just because a building was designed for seismic loading does not mean that the building will stand when subject to those loads. This fallacy exists because of the age of the Air Force inventory. Most buildings were constructed in an era when lateral load design procedures were not well developed. So, how does the Air Force define where the vulnerable buildings are?

Each active Air Force installation, to include Air National Guard and Reserve bases, has a building seismic safety inventory.<sup>19</sup> Information from the inventory can be used to assess the potential of a building, such as a dormitory, to collapse in the event of a bombing. It is possible to conceive that, had the building vulnerability at Kohbar Towers been known, the commander may have given serious consideration to lowering the number of building occupants. But, until every susceptible building is identified, and budget decisions are made, the fact that there are high-risk buildings must be accepted and the vulnerability recognized.

In the interim, the Air Force should be training people who can identify vulnerable buildings, and be available if there is an explosion that results in partial collapse. This will help officials assess whether such structures are likely to collapse and result in more casualties. The people are available in the response force, but the training program does not exist.

## **Training and Education**

“Air Force policy is to train and equip only personnel in, or deployable to, NBC (Nuclear, Biological, and Chemical) threat areas.”<sup>20</sup> The professional training of select people is accomplished by a small Air Force detachment located at Fort McClellan, Alabama. The select people who receive the training are those persons in the civil engineer organization assigned primary responsibilities as a Readiness Officer.<sup>21</sup> The Readiness Officer, in a Disaster Preparedness function, performs individual protection training to individuals in base units. Training for the contaminated environment is focused on individual performance of assigned wartime tasks. But, what if the response is to an event that occurs at an airbase that is not in a war zone?

### **Response Teams and Functions**

In his book *The Root: The Marines in Beirut, August 1982-February 1984*, author Eric Hammel describes the response of people at the scene of the bombing.

The first people to provide aid for the trapped and injured men in the BLT building were survivors of the blast itself. The engineers who were in the hooch beside the east wall collected their wits within a minute or two of the detonation and rushed into the open. LCpl Dan Gaffney pulled a grievously injured Marine from the TOW-section tent, and two of his companions gently led a dazed and staggering Marine to an out-of-the-way corner. Cpl Galen Weber was the first to suggest that the engineers clear a path through the rubble to the nearest road. The dazed engineers began moving rubble.

Moments after Pfc Carl Hancock left Post 2 to learn what had been hit, he came upon a screaming, terrified Marine pinned beneath a heavy chunk of wood outside the Lebanese Armed Forces (LAF) liaison building. Hancock freed the injured man and called over one of the first corpsman to arrive on the scene to care for him, then he headed toward the cloud of dust. A passerby told Hancock the BLT building was down, but he did not believe it until he rounded a corner and saw for himself. He ran to the rubble and started searching for survivors among the loose hands, heads, legs, arms, and torsos that littered the rubble-strewn ground.<sup>22</sup>

What would the result have been if the people delivering the bomb were lucky enough to disperse a chemical with the explosion? Did Marines know which parts of the building could be removed for the recovery of the injured without endangering those doing the rescue? Would the Air Force respond to a similar event, with similar actions, without endangering the rescue force?

The initial response force at a U.S. Air Force base will include security forces, medical people, and the fire department. The Disaster Preparedness people are not included because they are assigned responsibility for contamination avoidance functions. And, unfortunately, if the bomber was lucky, or technically skilled, and managed to disperse chemicals in an aerosol form coincident to the explosion, the response force would be dead. Only when there is evidence of a hazardous substance, i.e., sign, colored cloud, etc., is there a hazardous material response format (HAZMAT). When there is a HAZMAT response, OSHA safety Standards prescribe the minimum protection requirements and procedures. Do OSHA Standards govern in a chemical warfare environment? Are signs posted by the terrorist that says that a hazardous substance response is required? And, unfortunately, the suits worn by fire department responders are not designed to protect against chemical or biological agents. Even if the suits did provide chemical/ biological protection, would the first responders wear them if there were no fire? It may be an appropriate task to have first responders carry a chemical detector and have protective over garments, masks, and boots close at hand as a standard operating procedure.

## **Training for Structural Hazards**

At present, one should not expect civil engineering to have a structural engineer experienced in building failures or building type identification on the staff at the base. These skills do not come with the manning authorization or experience qualifications at the squadron level.

However, there is now a training requirement to establish a training program for response teams, including the 820<sup>th</sup> Security Force, which teaches how to recognize building types, critical structural elements, modes of failure, and what to expect when you move the debris. With such training, civil engineers will perform better in these responses and assessments than their predecessors.

## **Adopting Doctrine as a Counter to Threat**

A current Disaster Preparedness doctrine statement is “Decontamination must be aimed at restoring mission capability rather than totally eliminating the hazards.”<sup>23</sup> The expectation is that people can use contaminated equipment if they are properly protected. The assumption is that civil engineering will be using such equipment to respond to the attack. Logic suggests that people in protective gear operate that equipment until the mission can be resumed by avoiding the hazard. It is also assumed that the contamination will continue to exist until natural weathering defeats the hazard.

The contamination avoidance doctrine just described is a recognized procedure for operating in a contaminated environment. It is sound doctrine provided that we assume that we will not have any base recovery doctrine. The doctrine is adopted from Army criteria, which expects people to maneuver weapons around a contaminated area of

the battlefield. It is not probable that the Air Force will wait, for days, or weeks in cases of persistent chemicals, to generate sorties.

What if the geometric shape of the contaminated areas is such that aircraft are left contamination free, on the parking apron with no direct access to taxiways or the runways? Will the aircraft taxi through the contaminated area and risk spreading the contamination? Or, what if the contamination encircles the entrance to the hospital but the interior is determined to be contamination free? Will medics not use the hospital facilities because a toxic free area does not surround the building? These kinds of problems have yet to be addressed systematically.

### **Is Area Decontamination Required?**

Air Force Instruction (AFI) 10-211, *Civil Engineer Contingency Response Planning*, states that the Civil Engineer “must remove or neutralize nuclear, biological, or chemical contaminants on a priority basis so essential operations can resume and vital facilities can reactivate.”<sup>24</sup> Time factors are not specified. The role and responsibility includes providing trained and equipped personnel to perform limited area decontamination to include roads, grounds, buildings, aprons, taxiways, and runways. The specified levels of decontamination are Immediate, Operational and Thorough.

- Immediate decontamination is aimed at minimizing casualties, saving lives, and limiting the spread of contamination, and is to be performed by the individual as soon as contamination is suspected.
- Operational decontamination is aimed at minimizing contact or transferring hazards, performed by individuals, crews, or teams and involves decontaminating specific parts of essential equipment, material, work areas, and individual protective equipment.
- Thorough decontamination is aimed at reducing contamination to the lowest possible levels and maintaining operations with minimum degradation and is to be performed by units or wings.

The meaning of limited area decontamination remains vague and the level to which decontamination will be performed is defined only by how many people perform the work. Qualitative standards for levels of decontamination do not yet exist. So how many people are involved in limited area decontamination and what is defined as a limited area?

Area decontamination is discussed in Air Force Pamphlet (AFPAM) 10-219, Volume 3, *Post Attack and Post Disaster Procedures*. The first sentence in the section reads “Large area decontamination is not feasible with current equipment.”<sup>25</sup> Unfortunately, without large area decontamination capabilities to mitigate the problem of a base being attacked by chemical and biological weapons, there may be too much contamination to be mitigated using limited area decon-teams. So how is limited area decontamination to be accomplished? And, how can the civil engineering comply with a mandatory Air Force Instruction 10-211? Who and where is the proponent for area decontamination? There is none. This is a disaster scenario waiting to happen.

Individual decontamination is supposed to be accomplished using individual decontamination kits. A Lightweight Decontamination Apparatus (LDA), a portable pump and water heating unit, can be used for equipment, such as generators and compressors, and small areas. The latter is not a complete method of decontamination because “the LDA is unable to handle any of the standard decontamination agents.”<sup>26</sup> The alternate form of decontamination is to equip people with buckets, brooms, mops, bleach, hot water and soap. How long will it take these people to perform an operational level of decontamination? How many hours will the Air Force wait before moving airplanes or gaining access to the hospital?

An additional procedure for rapid area decontamination should be required. The level of decontamination should not be expected to be perfectly contamination free but must be such that equipment and people, with boots, coveralls and gloves, can traverse the area in reasonable safety. The area may contain some level of contamination, but full protective gear would not be required to allow individuals to work safely. Where is the doctrine statement that stimulates the proponents for providing the trained and equipped people to perform this act? At present, there is none.

### **Some General Considerations**

A strong doctrine statement about how the Air Force expects to recover from an attack is needed. The necessity of a doctrine statement is best summarized in Army Field Manual 100-5.

Doctrine is the statement of how America's Army as part of a joint team, intends to conduct war and operations other than war. It is the condensed expression of the Army's fundamental approach to fighting, influencing events in operations other than war, and deterring actions detrimental to the national interests. As an authoritative statement, doctrine must be definitive enough to guide specific operations, yet remain adaptable enough to address diverse and varied situations worldwide.<sup>27</sup>

Without the doctrine statement to guide procedures and training there will be some initial confusion if an airbase is attacked, and perhaps the needless death of some rescue workers. The problem may be resolved through on-the-spot creativity, or it may not be solved at all in the immediate aftermath of an attack. The purpose of doctrine is to eliminate the time lag between the event and the response. Doctrine provides the guidance for appropriate training.

The Air Force must train the way they will fight or they will probably fight more poorly than expected. Knowledge of both capabilities and limitations can only be gained

by exercising the ability to fight. An understanding of how to task and use assets are a key to achieving maximum effectiveness and using available resources to achieve force protection and to sustain the fight. Only through training can the priority for the identification, the development, and acquisition of force protection resources be determined.

### Notes

<sup>1</sup>Federal Emergency Management Agency, *National Mitigation Strategy: Partnerships for Building Safer Communities*, (Washington, D.C.: 8 October 1996), 1, on-line, Internet, 15 December 1997, available at <http://www.fema.gov/home/mit/ntmstrat.htm>.

<sup>2</sup>William J. Perry, "Combating Terrorism in Saudi Arabia: Prepared remarks before the Senate Armed Services Committee," *Defense Issues*, Vol. 11, No. 59 (9 July 1996).

<sup>3</sup>William P. Snyder, *Strategy: Defining It, Understanding It, and Making It*, (Maxwell AFB, AL.: Air War College, Air University, 1 June 1995), 1.

<sup>4</sup>*Ibid.*, 8.

<sup>5</sup>William J. Perry, "Combating Terrorism in Saudi Arabia: Prepared remarks before the Senate Armed Services Committee," *Defense Issues*, Vol. 11, No. 59 (9 July 1996), 3.

<sup>6</sup>Col. Dennis M. Drew and Dr. Donald M. Snow, *Making Strategy, An Introduction to National Security Processes and Problems*, (Maxwell AFB, Ala.: Air University Press, August 1988), 163.

<sup>7</sup>*Ibid.*, 174.

<sup>8</sup>Senate, *Saudi Arabia and Beirut, Lessons Learned on Intelligence Support and Counterterrorism Programs: Hearings before the Select Committee on Intelligence*, 104<sup>th</sup> Cong., 2<sup>nd</sup> sess., 9 July 1996, 4-6.

<sup>9</sup>Matthys Levy and Mario Salvadori, *Why Buildings Fall Down*, (New York, New York: W.W. Norton & Company, Inc., 1994).

<sup>10</sup>Lt Gen James F. Record, 12<sup>th</sup> AF/CC, memorandum for Air Force Chief of Staff, subject: Air Force Review of Gen (Ret.) Downing Report – Khobar Towers, 31 October 1996, 12.

<sup>11</sup>*Ibid.*

<sup>12</sup>Quoted in *Engineering News Record*, "Progressive Collapse Felled Murrah Building, Report Says," 25 November 1996, 21. The American Society of Engineers issued a report 14 November 1996 that stated "If current seismic protection had been used (in the Murrah Building) the loss of lives and damage would have been reduced substantially." A supplement to the Downing Report prepared by Wright Laboratories, Inc. says that "Earthquake technologies, employing ductility and mass to resist seismic effects, can in part be applied to the problem of blast resistance."

## Notes

<sup>13</sup> William James Perry, *Force Protection: Global Interests, Global Responsibilities: Secretary of Defense report to the President*, (Washington, D.C.: Department of Defense, 16 September 1996).

<sup>14</sup> *Ibid.*

<sup>15</sup> Federal Emergency Management Agency, *NEHRP Handbook for the Seismic Evaluation of Existing Buildings*, FEMA 178 (Washington D.C.: Building Seismic Safety Council, June 1992), B-1.

<sup>16</sup> *Engineering News Record*, 25 November 1996, 21.

<sup>17</sup> United States Air Force, *Installation Force Protection Guide*, (Brooks AFB, TX: Air Force Center for Environmental Excellence, 1997), 35.

<sup>18</sup> General Accounting Office, *Report to Congressional Committees: Federal Buildings, Many Are Threatened by Earthquakes, but Limited Action Has Been Taken*, (Washington, D.C.: General Accounting Office, May 1992), 5.

<sup>19</sup> Executive Order 12941, *Seismic Safety of Existing and Leased Federal Buildings*.

<sup>20</sup> Department of Defense, Nuclear, Biological, Chemical Defense: Annual Report to Congress, 1997, Chapter 5, "NBC Defense Readiness and Training," (Washington, D.C.: Office of the Assistant Secretary of Defense [Acquisition and Technology], November 1997), 5-8, on-line, Internet, 25 November 1997, available on <http://defenselink.mil.pubs/>.

<sup>21</sup> Air Force Civil Engineer Support Agency, Readiness Directorate, *Readiness and Disaster Preparedness Training Packages*, 1 February 1997, on-line, Internet, 1 December 1997, available on <http://www.afcesa.af.mil/AFCESA/Readiness/Readiness/training.html>.

<sup>22</sup> Eric M. Hammel, *The Root: The Marines in Bierut, August 1982-February 1984*. (San Diego, CA: Harcourt, Brace, Jovanovich, 1985), 330.

<sup>23</sup> Air Force Civil Engineering Support Agency, Readiness Division, *Readiness and Disaster Preparedness Package 15,2-2*.

<sup>24</sup> AFI 10-211, paragraph 3.3.7.

<sup>25</sup> AFPAM 10-219, Volume 3, *Post Attack and Post Disaster Procedures*, 1 April 1997, paragraph 5.8.

<sup>26</sup> *Ibid.*, paragraph 5.6.1.3.

<sup>27</sup> Army Field Manual 100-5, Operations, June 1993, 1-1.

## Chapter 4

### Considerations, Observations, and Conclusions

*The reasonable man adapts himself to the world; the unreasonable one persists in trying to adapt the world to himself. Therefore, all progress depends on the unreasonable man.*

-George Bernard Shaw

The aftermath of the Khobar Towers incident brought a recommendation for removal from the promotion list of Brigadier General Terryl Schwalier. The recommendation by Secretary of Defense William Cohen put an end to a distinguished military career. In making his recommendation, Secretary Cohen said, “command did not develop an effective plan for how personnel would be alerted and removed from harm’s way in the event a stand-off bomb attack occurred.”<sup>1</sup> It appears that Secretary Cohen thought that someone did not allow time for thinking through plans of action. An argument against his position is that Secretary Cohen thought there was a plan of action better than the one selected by Gen. Schwalier.

The Downing report is also critical of the command structure. “The chain of command did not provide adequate guidance and support to General Schwalier.”<sup>2</sup> Or, was the chain of command not supportive because no one on the staff would enunciate the deficiencies? Were the budget and program exercises the same as the routine, day-in

and day-out, business-as-usual, as practiced at domestic bases? Is this why Lt. Gen. Record identified the need for a “change in mind set?”

### **What is a New Mind Set?**

A vulnerability survey for Khobar Towers described the threat six months before the event occurred.<sup>3</sup> The “most serious threats to Khobar was a vehicle bomb that either penetrated the compound or was detonated at the perimeter.”<sup>4</sup> The same survey identified 39 security violations. All but three of the 39 deficiencies were mitigated before the bomb exploded.

On the evening of the attack, a sentry on the roof of building 131 at Khobar Towers identified the bomb. He did all in his power to alert the building occupants in the four minutes before the bomb exploded. For that reason Secretary Cohen placed significance in the deficiency of “no effective alarm system.” This was one of the three deficiencies.

A fire alarm system was proposed, programmed, and was in the long-range plan for installation. However, Wing leaders (staff) had decided not to install fire alarms in the dormitories because the buildings were not constructed of combustible materials.<sup>5</sup> Another reason given for not installing a fire alarm was an advisory, published in DoD and JCS documents, for fire alarms to be easily distinguishable from bomb threat alarms. Despite the fact that everyone was aware that the primary alarm system, “Giant Voice,” was limited in use, the base staff unfortunately decided to follow fire regulation rather than common sense. Did anyone consider an alternative? It is unknown.

Would there have been a difference if there had been some type of alarm in the hallway of the building? Would a cowbell on a rope have worked for that interim period

when there was debate about the alarm issue? The responsibility for alarm systems, detection devices, evacuation plans, and drills falls within the responsibilities of civil engineering. Within civil engineering, evacuation plans are the responsibility of Disaster Preparedness. It is easy to come to the conclusion that the readiness people in civil engineering should have come to the conclusion that an alarm system other than a fire alarm was necessary. It is also easy to come to the conclusion that they should have seen to the installation of that alarm system. This is a false conclusion. The people in readiness are only charged with the development of plans and doing training if an evacuation of the building was necessary. The base leadership is responsible for providing the synergy to make plans work. The alarm issue demonstrates a general breakdown of the role and responsibility of the Disaster Preparedness function.

The second outstanding security deficiency involved a recommendation to install Mylar on building windows. Mylar reduces the probability that glass will shatter, and/or splinter, upon impact or from blast overpressure. The \$4,000,000 cost estimate probably influenced the decision to place the requirement in the long-range project list. In the end, considering that the building collapsed, the relevance of Mylar is a moot point. But, had the blast not caused the partial collapse of the building, and had the Mylar been installed, would the windows have stayed in the frames? Mylar installation on the windows is a secondary issue in this case. The primary question in this situation is this, “Did anyone suspect that the building ends would move four feet and cause the collapse of the building?”

Someone did ask the question. “The AFOSI at Khobar Towers consulted Explosive Ordnance Disposal (EOD) personnel for guidance on damage estimates for the

buildings on the north perimeter. EOD believed the damage would be held to a minimum if vehicles were kept a minimum of 25 yards from the building.”<sup>6</sup> It was the right question but the wrong person answered the question. The EOD people work in civil engineering. The EOD people know about explosives. Civil engineering employs people with expertise in the analysis of building response to lateral loads. The expertise is inherent to the civil engineering function, but it is not immediately incorporated into the base level unit. The people that did provide the answer were not the correct responders. The structural expertise of the civil engineering function should have answered the question.

The third outstanding deficiency was dismissed from any consideration. It was an idea about building a perimeter wall around Khobar Towers. A wall may not have solved the security problem, but the reasons for rejection of the idea is certainly due some comment. “Specifically, the Security Police did not want to be sealed in because they would not be able to see what was going on outside the compound. EOD personnel stated that the wall might not be effective due to the physics of the blast wave. The proposal for a wall did not progress beyond this discussion phase.”<sup>7</sup>

Walls are recognized counters to blast threats. However, the blast wall does require a special design to preclude an undesirable blast wave effect. The decision to reject the wall should have been made by civil engineering using site characteristics and opinions from those experienced in blast wall design. That expertise does not exist at the unit level, but that does not exclude the use of expertise from outside of the unit organization.

A change of mind set away from parochial interests, the usual business day, or legalistic entrenchment in regulations could have influenced the outcome at Khobar Towers. Would that outcome have changed the final outcome? Any answer can only be speculative.

## **Get the Priority Correct**

Has the Air Force learned a lesson? Will the military continue to go on and “never seem to learn” per the testimony of Gen. Trainor? There are at least six lessons that should be considered in future preparations for force protection. Unfortunately, the creation of the Air Force Security Forces does not appear to incorporate these lessons except in the form of physical security.

### **Lesson One:**

- There is an over-reliance on the expectation of better intelligence and the hope of commanders for a predictive ability. Secretary of Defense William Perry, in comments to the Senate Armed forces committee, said, “The critical limitation on anti-terrorist intelligence is warning on specific terrorist operations. You need a critical level of intelligence to prevent an attack. Short of that level of information, commanders have to plan for a wide range of cases.”<sup>8</sup> That planning must start with “no notice” attack scenarios. The planning appears to be missing from the Air Force effort to establish force protection, even in the worst case.

### **Lesson Two:**

- Passive defense must be equally important as an active defense. An analysis of the roles and responsibilities issues would indicate that passive defense is a stepchild of the active defense unit. It is part of the family but lacks the instinctive maternal care. This must be corrected.

### **Lesson Three:**

- There must be security and protection in buildings housing airmen and critical missions. The information that is necessary to make the determination exists, but no one appears to be using it. Will new buildings be designed to incorporate protective features? It is a policy in other government agencies, but only a recommendation within the Air Force.

### **Lesson Four:**

- Vulnerabilities in the form of organizing, training, and equipping for recovery from an attack still exist and must be corrected. The 820<sup>th</sup> Security Forces is

intended to provide an armed force outside the fence and within a tactical perimeter. Is physical security and technology acquisition the complete answer? History says no. Both Generals Downing and Record implied that force protection, in the form of physical security, is not the total answer.

Lesson Five:

- Risk assessment and vulnerability processes require a focus that includes other threats other than physical security, location, and terrain.

Lesson Six:

- Look back at lessons one through five.

Developing a solution and beginning mitigation in the Force Protection program begins with the clear articulation of what it is that leadership expects. Expectations are the starting for point for the statement of strategy and doctrine. When strategy and doctrine are in place, organization, equipment, and training requirements should naturally follow.

It is important not to allow the first thoughts for mitigation of the force protection problem to be rejected because of diminishing resources. Some solutions do not require the expenditure of competing resources. A policy statement requiring that buildings used for the housing or assembly of people must be designed for seismic forces is a start. The Air Force cannot afford to harden all it's facilities, but steps towards minimizing needless collateral deaths can begin without funds or large manpower pools. A synergistic integration of doctrinal publications is a second solution. But, when resources do begin to compete, policy, strategy, and doctrine must provide the prioritization.

Last, but not the least, it is important to realize the nature of the threat. It probably won't be a horde of enemy soldiers advancing towards the airbase with weapons blazing. The threat is the very organization that the airbase is depending upon

to recover from an attack. The time to minimize the vulnerability is when the risk is low. As each day passes the Air Force gets closer to the day when the risk will be high.

### **The Bottom Line**

It is time to think about how the U.S. Air Force is going to respond to the next event. Will Air Force civil engineering support the requirements of the 820<sup>th</sup> Security Force? Yes, it probably will if the task is limited to bed-down of the unit and to carry out explosive ordinance disposal. But, there is an apparent apprehension in the civil engineering community to articulate the full requirements that will provide an effective and synergistic disaster preparedness capability. There is a failure of the leadership community to identify and implement training programs associated with base recovery. And, just as with Khobar Towers, there is an apparent unwillingness to consider interim solutions for the disaster preparedness problem other than “budget line item solutions.”

When you talk to a Disaster Preparedness person you will find them to be knowledgeable and more than willing to discuss the inconsistencies of the program. They will also explain that their expertise is because of the years spent trying to get organizational units at the base level to discuss plans and perform the recommended training. It will be important to consult these experts and collect their thoughts and experiences, and to integrate the expertise into the organizations and the implementing publications. If we do not, our first responders will require last rites.

Whatever the final force protection solution, Joseph Pilat sums the situation up with his statement that “however NBC terrorism may play out in the future, it is clear that the United States and other democracies are vulnerable to NBC attacks and to other

forms of terrorism. Vulnerabilities must be addressed on the basis of sober analysis and the prioritization of risks.”<sup>9</sup>

### Notes

<sup>1</sup> William S. Cohen, *Report: Personal Accountability for Force Protection at Khobar Towers*, (Washington, D.C.: Secretary of Defense, 31 July 1997), 5.

<sup>2</sup> *Ibid.*, 2.

<sup>3</sup> Lt Gen James F. Record, 12<sup>th</sup> AF/CC, memorandum to Air Force Chief of Staff and Secretary of the Air Force, In Turn, subject: Independent Review of the Khobar Towers Bombing, Part A, 31 October 1996, 2, on-line, Internet, October 1997, available from <http://www.af.mil/current/Khobar>.

<sup>4</sup> William S. Cohen, *Report: Personal Accountability*, 2.

<sup>5</sup> *Ibid.* 6.

<sup>6</sup> Lt Gen James F. Record, memorandum, 47.

<sup>7</sup> *Ibid.*, 48.

<sup>8</sup> William J. Perry, “Combating Terrorism in Saudi Arabia, Prepared Statement to the Senate Armed Services Committee, July 9, 1996,” *Defense Issues*, Vol 11, No.59, 6, on-line, Internet, December 1997, available from <http://www.defenselink.mil/pubs/di96>.

<sup>9</sup> Joseph F. Pilat, “NBC Terrorism After Tokyo,” in *Terrorism With Chemical and Biological Weapons: Calibrating Risks and Responses*, ed. Brad Roberts, (Alexandria, VA: The Chemical and Biological Arms Control Institute, 1997), 10.

## ***Bibliography***

- Air Force Doctrine Document (AFDD) 2-3. *Military Operations Other Than War*. 5 October 1996.
- Air Force Engineering Technical Letter (ETL) 97-12. *Mitigation of Existing Building Structural Deficiencies for Seismic and High Wind Loads*. December 1997.
- Air Force Handbook (AFH) 10-222, Volume 3. *Guide to Civil Engineer Force Protection*. 1 June 1997.
- Air Force Instruction (AFI) 10-210. *Prime Base Engineer Emergency Force Program*.
- Air Force Instruction (AFI) 10-211. *Civil Engineer Contingency Response Planning*. 30 March 1994.
- Air Force Instruction (AFI) 10-212. *Air Base Operability*, 29 April 1994.
- Air Force Instruction (AFI) 31-210. *The Air Force Antiterrorism (AT) Program*, 1 Jul 1997.
- Air Force Instruction (AFI) 32-4001. *Disaster Preparedness Planning and Operations*. 1 August 1997.
- Air Force Manual (AFM) 32-4005. *Personnel Protection and Attack Actions*. 1 October 1995.
- Air Force Pamphlet (AFP) 10-219. *Post Attack and Post Disaster Procedures*, 1 April 1997.
- Air Force Policy Directive (AFPD) 10-8. *Air Force Support to Civil Authorities*, 1 August 1994.
- Air Force Policy Directive (AFPD) 32-40. *Disaster Preparedness*. 1 May 1997.
- Air Force Security Force Fact Sheet. *Force Protection*. 17 December 1997. On-line. Internet, 9 January 1998. Available from <http://www.issues.af.mil/forcprot.html>.
- Cohen, William S., Secretary of Defense. *Executive Summary: Personal Accountability for Force Protection at Kohbar Towers*. Washington, D.C.: Department of Defense. 31 July 1997. On-line. Internet, 2 February 1998. Available from <http://www.defenselink.mil/pubs/khobar/>.
- Cohen, William S., Secretary of Defense. *Report: Personal Accountability for Force Protection at Kohbar Towers*. Washington, D.C.: Department of Defense. 31 July 1997. On-line. Internet, 2 February 1998. Available from <http://www.defenselink.mil/pubs/khobar/>.
- Concept of Operations on Civil Engineer Readiness Flight*. HQ AFCESA/CEXR, Tyndall AFB, FL. 22 August 1995.
- Department of Defense (DoD) Directive 2000.12. *Department of Defense Combating Terrorism Program*, 15 September 1996.
- Report of the Downing Assessment Task Force, Report (U). *Force Protection Assessment of USCENTCOM AOR and Khobar Towers*. 30 Aug 1996.

- Drew, Col. Dennis M. and Snow, Dr. Donald M. *Making Strategy, An Introduction to National Security Processes and Problems*. Air University Press, Maxwell AFB, Alabama. August 1988.
- Federal Emergency Management Agency. *NEHRP Handbook for the Seismic Evaluation of Existing Buildings*, FEMA – 178. Washington, D.C.: Building Seismic Safety Council, June 1992.
- Hammel, Eric M. *The Root: The Marines in Bierut, August 1982-February 1984*. San Diego, CA: Harcourt, Brace, Jovanovich, 1985.
- Installation Force Protection Guide, U.S. Air Force*. AFCEE/DG, Brooks AFB, TX.
- Joint Chiefs of Staff (JCS) Publication 3.07-2. *Joint Tactics, Techniques, and Procedures for Antiterrorism*, 1996.
- Kaplan, David E. and Marshall, Andrew. *The Cult at the End of the World*. Crown Publishers, Inc., New York, 1996.
- Levy, Matthys, and Salvadori, Mario. *Why Buildings Fall Down*. New York, New York: W.W. Norton & Company, Inc. 1994.
- Myroie, Laurie. *The World Trade Center Bomb: Who Is Ramzi Yousef? And Why It Matters*. The National Interest-Winter 1995/96, Number 42, page 3.
- Perry, William James. Force Protection: Global Interests, Global Responsibilities: Secretary of Defense report to the President. 16 September 1996. Report to the President and Congress on the protection of U.S. Forces deployed abroad. Washington D.C.: Dept. of Defense. 15 September 1996.
- Perry, William J., Shalikashvili, General John M., and Peay, General J.H. Binford III. Prepared statements to the Senate Armed Services Committee, 9 July 1996. *Combating Terrorism in Saudi Arabia*. Defense Issues, Volume 11, Number 59. On-line. Available from [www.defenselink.mil/pubs/di96](http://www.defenselink.mil/pubs/di96).
- Pilat, Joseph F. "NBC Terrorism After Tokyo." In *Terrorism With Chemical and Biological Weapons: Calibrating Risks and Responses*. Edited by Brad Roberts. The Chemical and Biological Arms Control Institute; Alexandria, VA; 1997.
- Prime BEEF Equipment and Supplies Listing*. HQ AFCESA/CEXR, Tyndall AFB, FL. 1 January 1997.
- Progressive Collapse Felled Murrah Building, Report Says*. Engineering News Record, 25 November 1996, page 21.
- Readiness and Disaster Preparedness Training Packages*. HQ AFCESA/CEX, Tyndall AFB, FL. On-Line. Internet, 01 December 1997. Available from <http://www.afcesa.af.mil/AFCESA/Readiness>.
- Record, Lt Gen James F., 12<sup>th</sup> AF/CC. Memorandum. To Air Force Chief of Staff and Secretary of the Air Force, In Turn. Subject: Independent Review of the Khobar Towers Bombing, Part A, 31 October 1996. On-Line. Internet, October 1997. Available from <http://www.af.mil/current/Khobar>.
- Record, Lt Gen James F., 12<sup>th</sup> AF/CC. Memorandum. To Air Force Chief of Staff and Secretary of the Air Force, In Turn. Subject: Independent Review of the Khobar Towers Bombing, Part III, Readiness Issues, 31 October 1996. On-Line. Internet, 25 November 1997. Available from <http://www.af.mil/current/Khobar>.
- Salvadori, Mario. *Why Buildings Stand Up*. . New York, New York: W.W. Norton & Company, Inc., 1990.

- Shalikashvili, General John M., Chairman of the Joint Chiefs of Staff. *Posture Statement: before the 105<sup>th</sup> Congress*. 12 February 1997. On-Line. 10 September 1997. Available from <http://www.dtic.dla.mil/cgi-bin/waisgate>.
- Shalikashvili, John M., Chairman of the Joint Chiefs of Staff. *National Military Strategy: Shape, Respond, Prepare Now – A Military Strategy for a New Era*. Washington, D.C. 1997. On Line. Internet, 13 November 1997. Available from <http://www.dtic.mil/jcs/nms/>.
- Shlapak, David A. *Check Six Begins on the Ground: Responding to the evolving ground threat to U.S. Air Force bases*. Rand Corporation, Santa Monica, CA. 1995.
- Snyder, William P. *Strategy: Defining It, Understanding It, and Making It*. Air War College, Air University, Maxwell AFB, AL. 1 June 1995.
- United States Air Force. *Installation Force Protection Guide*. Brooks AFB, TX: Air Force Center for Environmental Excellence, 1997.
- US Department of Defense. *Nuclear, Biological, and Chemical Defense Annual Report to Congress*. Washington, D.C.: Office of the Assistant Secretary of Defense (Acquisition and Technology), November 1997. On-Line. Internet, 25 November 1997. Available from DefenseLINK from <http://www.defenselink.mil/pubs/>.
- US Department of Defense. *Proliferation: Threat and Response 1997*. Washington, D.C. November 1997. On line. Internet, 25 November 1997. Available from DefenseLINK from <http://www.defenselink.mil/pubs/>.
- US Department of State. *Patterns of Global Terrorism*, 1995. Washington D.C.: Office of the Coordinator for Counterterrorism, April 1996.
- US Senate. *Saudi Arabia and Beirut: Lesson Learned on Intelligence Support and Counterterrorism Programs: Hearing before the Select Committee on Intelligence*. 104<sup>th</sup> Cong., 2d sess., 1996.
- US Senate. *Oklahoma City Bombing: Hearing before a Subcommittee of the Committee on Appropriations*. 104<sup>th</sup> Cong., 1<sup>st</sup> sess., 1995.